

AND TOBAGO

(*SOCIETY PAPER, No. 520.*)

Further Note on the Caroni Series at Savaneta.

BY

R. J. LECHMERE GUPPY,

Honorary Consulting Geologist to the Society.

*Read before a General Meeting of the Society held
in the Council Chamber,*

13TH SEPTEMBER, 1912.

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BY the kindness of F. J. Morris, Esq., of Forres Park, I was able to make a second visit to the Springvale Quarry and also have a general look at the country in the neighbourhood which I had not seen for some years. This enabled me to gain some additional information of importance in settling the position, &c. of the Springvale Shellbed. Indeed, I found that the bed named was really an outcrop of the the same series as that discovered by the late Louis Alexander Leroy, the fossils from which I have already described and named. Mr. Morris took me to the Quarry where I found that the later excavations had revealed the thickness dip and position of the Shellbed. It was apparently from three to four feet thick. The dip was about 30 degrees to the N.W. The Shellbed lay conformably upon which I might call a mudbed; a stratum of impure clay with comminuted shells. These observations bring the Springvale Shellbed into line with the Caroni series as laid down by Wall and Sawkins in the Geological Report on Trinidad, 1860, pp. 43, 45. The



strata underlying the Shellbed pass downwards into fine-grained soft rocks characterized by the Foraminifer *Planorbulina larvata*. This position is correctly indicated in the Diagram at p. 30 of *The Proceedings* of The Society illustrating my Paper on Recent Geological Discoveries (Vol. XII., 1912). These strata are there indicated by the letter h₃ and h₂ (Page 9 of separate copies)

Interstratified with the mudbeds are strata of a more permeable quality, consisting of fine sandstones, and these pass in places into gravel beds sometimes indurated and these sandy and gravel beds allow of the percolation and storage of water whence the springs which are common in this country. The lower portion of the Caroni Series especially contains gravel beds which seem to overlie the cretaceous rocks. In fact the gravelly and sandy beds of the Tertiaries are here chiefly derived from the cretaceous series. I did not see the lower miocene beds (the Tamana Series) exposed anywhere in this locality, and it is possible that they may not have been developed here, or they may be in part or wholly represented by the strata underlying the Shellbed.

On one point it seems necessary to give a caution. That is, that the diagrams attached to my papers are not intended in any way as finished plans or sections. Thus the diagram of the Orbitoides Bed (*Proceedings*, p 204) is intended only to show approximately the position of that bed ; it is not drawn to scale nor is it intended to show the dip or the relations of the other beds. The diagram is sufficient for its purpose. The faults shown in the diagram of which it is a modified copy (Journ. Geol. Soc. 1892, Page 522) are not indicated. Again the diagram at Page 9 of my Paper on Recent Geological Discoveries, page 30 of *Proceedings*) is purely diagrammatic. It shows correctly the relations of the strata so far as yet ascertained. But these diagrams are merely generalized sections, and for convenience the height is

greatly exaggerated and no attempt is made to show the minute details of structure or to give the exact proportions of the different beds. As regards faults it is rarely easy in the case of the Naparima Rocks to ascertain whether a dislocation is certainly a fault or merely a fold. There is usually crushing and displacement accompanied by disintegration especially along synclinal or anticlinal lines. The intimate relation of faulting and folding is shown by Mellard Reade in the *Geological Magazine* for 1896, page 353.

Owing to the kindness of Mr. Morris I secured from the Springvale Quarry an example of *Cypraea henekeni*, a species discovered in the Haitian Miocene and not since recorded from any other locality. This specie is remarkable for the bosses or tubercles, which resemble those of *C. mus* an allied living species.

The Corosal Road Ditrupabed and the Pointapier Ditrupabed have proved to belong to the Upper Miocene series called the Caroni series by Wall and Sawkins. The material supplied me by Mr. Raspass contains molluskan fossils as well as the characteristic Foraminifer *Planorbulina larvata*. I give the names of some of these, but there are many more species.

The Foraminifer *Planorbulina larvata* seems to have played in the Caroni Miocene Series a part similar to that of the *Orbitoides* in the Eocene formations. Both are extremely abundant in beds whose fauna and constitution denote a moderate depth, say fifty to two hundred fathoms of water. The *Orbitoides* type of foraminifera is altogether extinct : while the *Planorbulina*, which is an extreme cyclical development of the type exemplified by *Pl. mediteranensis* and *Pl. vulgaris* is only found in the living state in the Pacific and Indian seas.

The tubeshell found abundantly in the Ditrupabed of Pointapier and taken by me in the first instance to be the shell of a worm and hence called by me Ditrupa, was afterwards determined to be a Mollusk. It was described as *Cadulus parianus* in the Proceedings of the U. S. National Museum (Vol. xix, 1896, Page 325, Pl. xxx F. 7.) in the Corosal Road Bed a somewhat similar shell occurs. This is marked by distinct characters. It widens more gradually from the initial to the oral end, and it is annulate by rounded costæ while *C. parianus* is smooth. Thus it has some resemblance to *Cæcum*. It may be diagnosed as follows.

CADULUS PERANULATUS N. SP.

Shell tubular curved widening somewhat rapidly, annulate by regular rounded riblets, swollen near the broader end and constricted at the aperture. Length 4 mm. greatest diameter 1mm. The annulations become larger and obsolescent towards the oral end.

I have also detected the following Molluska in the Corosal Ditrupabed

Cylichna mirrotrema Dal. *Corbula heterogenea* Gup.

Turbonila tenuilineata Gup. *Leda acuta* Gab.

Benthonella turbinata Gup. *Leda flexuosa* Heilp.

Marginela arcuata Gup.

Marginela soverbii Gab. *Dentalium prisma* Dal.

Mangelia consentanea Gup.

Clavatula labiata Gab.

Pleurotoma haitonse Sow.

Teinostoma (Vitrinella) vitrea Gab.

Clea truncata Gab.

Nasa caribea Gab.

Some polyzoa also occur in the bed, the most noticeable being *Diastoporela umbelata* or a nearly allied species, and a *Vincularia*. These are also found in the Pointapier Ditrupabed : they are almost always in fragments. Besides *Planorbulina larvata* other Foraminifera occur for instance *Cornuspira* and *amodiscus*. Many others await a diligent collector. The determinations I have given are in some cases approximate only and must be verified by additional examples and further study. There is a grand field here for the collector of fossils.



